

*REMARKS/ARGUMENTS**The Pending Claims*

Claims 1, 2, and 5-11 are pending and directed to an isolated modified PQQGDH (claims 1 and 2), as well as a gene encoding the modified PQQGDH (claim 5), a vector comprising the gene (claim 6), a transformant comprising the vector (claim 7), a method of producing the modified PQQGDH (claim 8), a glucose assay kit comprising the modified PQQGDH (claim 9), a glucose sensor comprising the modified PQQGDH (claim 10), and a method of measuring glucose comprising the modified PQQGDH (claim 11).

Claims 5-11 have been labeled as withdrawn as directed to a non-elected invention. Applicants request the rejoinder and examination of withdrawn claims that are dependent on, or otherwise include all of the features of, an allowed claim.

Amendments to the Claims

Claim 1 has been amended to recite that the modified PQQGDH is isolated. Additionally, claim 1 has been amended to recite that the modified PQQGDH consists of SEQ ID NO: 1 except that the glutamine at position 168 and the leucine at position 169 of SEQ ID NO: 1 are substituted with other amino acids, as supported by the specification at, for example, page 16, lines 3-7. Claim 1 also has been amended to recite that the modified PQQGDH has less dehydrogenase activity on a disaccharide than wild type PQQGDH, as supported by the specification at, for example, page 8, line 30.

Claim 2 has been amended to recite that the modified PQQGDH has more thermal stability than wild type PQQGDH, as supported by the specification at, for example, page 7, line 35, through page 8, line 7.

Claims 3, 4 and 12-18 have been canceled.

No new matter has been added by way of these amendments.

Summary of the Office Action

The Office has made final the restriction requirement and withdrawn non-elected claims 3 and 5-18 from consideration.

The Office objects to claim 4 for allegedly depending from a non-elected claim (claim 3).

The Office rejects claims 1, 2, and 4 under 35 U.S.C. § 101 as allegedly directed to non-statutory subject matter.

The Office rejects claims 1, 2, and 4 under 35 U.S.C. § 112, second paragraph, as allegedly indefinite.

The Office rejects claims 1, 2, and 4 under 35 U.S.C. § 112, first paragraph, as allegedly lacking written description and enablement.

The Office rejects claims 1, 2 and 4 under (a) 35 U.S.C. § 102(b) as allegedly anticipated by Sode et al. (U.S. Patent 6,103,509) and (b) 35 U.S.C. § 102(a) as allegedly anticipated by Takeshima et al. (EP 1367120).

Reconsideration of the objection and rejections is hereby requested.

Discussion of the Claim Objection

The Office contends that claim 4 depends from a non-elected claim (claim 3) and requires correction. Claim 4 has been canceled. Accordingly, Applicants request that the claim objection be withdrawn.

Discussion of the Section 101 Rejection

The Office contends that claims 1, 2, and 4 are directed to non-statutory subject matter. Claim 1 (and, thus, claim 2 dependent thereon) has been amended to recite that the modified PQQGDH is isolated. Claim 4 has been canceled.

In view of the amendment to the claims, Applicants request that the non-statutory subject matter rejection be withdrawn.

Discussion of the Section 112, Second Paragraph, Rejection

The Office contends that claims 1, 2, and 4 are indefinite because the claims recite unclear phrases. As discussed above, claim 4 has been canceled. Claim 1, as amended,

recites that the modified PQQGDH has less glucose dehydrogenase activity on a disaccharide than wild type PQQGDH. Claim 2, as amended, recites that the modified PQQGDH has more thermal stability than wild type PQQGDH. The wild type PQQGDH has been explicitly defined as consisting of SEQ ID NO: 1. The meanings of the phrases in the claims are clear in and of themselves as well as in view of the description in the specification (see, e.g., page 7, line 35, through page 8, line 7; page 8, lines 27-32; and Tables 2, 13, and 14).

Accordingly, Applicants request that the indefiniteness rejection be withdrawn.

Discussion of the Section 112, First Paragraph, Rejections

The Office contends that claims 1, 2, and 4 lack written description and enablement for all variants, mutants, and recombinants encompassed by the pending claims.

The claims, as amended, recite that the modified PQQGDH comprises SEQ ID NO: 1 except for amino acid substitutions at residues 168 and 169 of SEQ ID NO: 1. Additionally, the modified PQQGDH must have less dehydrogenase activity on a disaccharide than wild type PQQGDH, which is explicitly defined as consisting of SEQ ID NO: 1 without any modifications. The specification describes the modified PQQGDH at, for example, page 16, lines 3-7. Furthermore, the specification discloses that the double mutation has improved thermal stability and/or improved substrate specificity (i.e., lowered glucose dehydrogenase activity on a disaccharide, such as maltose) as compared to the wild type PQQGDH (see, e.g., Tables 2, 13, and 14).

Accordingly, the specification adequately describes and enables the subject matter of the claims, and the written description and enablement rejections should be withdrawn.

Discussion of the Section 102 Rejections

The Office contends that claims 1, 2, and 4 are anticipated by Takeshima et al. (EP 1 367 120 A2). Applicants note that Takeshima et al. published on December 3, 2003. The current application claims priority to Japanese Patent Application 2003-315797, filed on August 8, 2003, which is before the publication date of Takeshima et al. An English translation of the Japanese priority document is submitted herewith. Since the Japanese

priority document contains support for the pending claims, Takeshima et al. cannot be considered to be prior art to the pending claims.

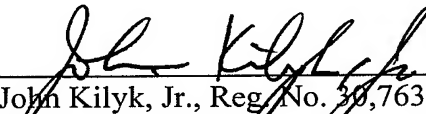
The Office also contends that claims 1, 2, and 4 are anticipated by Sode et al. Sode et al. does not disclose or suggest a modified PQQGDH with amino acid substitutions at positions 168 and 169, as recited in the pending claims. Since Sode et al. does not disclose every element of the pending claims, Sode et al. cannot be considered to anticipate the pending claims.

For these reasons, Applicants request that the anticipation rejections be withdrawn.

Conclusion

Applicants respectfully submit that the patent application is in condition for allowance. If, in the opinion of the Examiner, a telephone conference would expedite the prosecution of the subject application, the Examiner is invited to call the undersigned attorney.

Respectfully submitted,


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